Niclosamide

Multifunctional anthelmintic and signaling pathway inhibitor

Niclosamide is a chlorinated salicylanilide compound originally developed as an anthelmintic agent for treating tapeworm infections. Beyond its antiparasitic use, it has gained significant attention in biomedical research for its ability to modulate multiple signaling pathways, including STAT3, NF-κB, Wnt/β-catenin, and mTORC1. It exhibits potent inhibitory activity with an IC_{50} of 0.25 μM for STAT3-mediated transcription.

Key features and applications include:

- **STAT3 Inhibition:** Blocks STAT3 activation, nuclear translocation, and transcriptional activity, leading to apoptosis and cell cycle arrest in cancer cells.
- **mTORC1 and Autophagy Modulation:** Reversibly inhibits mTORC1 signaling and stimulates autophagy, making it useful in metabolic and cancer research.
- **Mitochondrial Uncoupler:** Disrupts oxidative phosphorylation, reducing ATP levels and activating AMPK, which enhances lipid oxidation.
- **Wnt/β-Catenin Pathway Inhibition:** Used to study Wnt signaling in cancer and stem cell biology.
- **NF-κB Pathway Suppression:** Inhibits IκBα phosphorylation and downstream inflammatory gene expression.

Research Applications:

- Cancer biology (e.g., AML, prostate, colorectal)
- Metabolic disease and obesity models
- Antiviral and antibacterial studies
- Autophagy and mitochondrial function assays
- Drug repurposing and high-throughput screening

Relevant disease states include:

- **Cancer:** Demonstrates antitumor activity in models of acute myelogenous leukemia (AML), prostate, breast, and colorectal cancers by targeting STAT3 and Wnt signaling.
- **Metabolic Disorders:** Enhances lipid oxidation and activates AMPK, making it relevant in obesity and type 2 diabetes research.
- **Neurodegenerative Diseases:** Investigated for its role in modulating mitochondrial function and autophagy.
- **Infectious Diseases:**

  Explored for antiviral and antibacterial properties, including potential activity against SARS-CoV-2.
- **Inflammatory Conditions:** Suppresses NF-κB signaling, reducing pro-inflammatory cytokine expression.

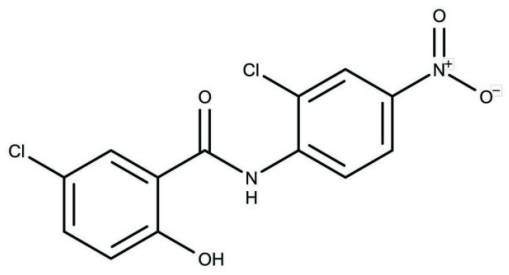
Ordering Information

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ENZ-CHM341-0005	5g

Manuals, SDS & CofA

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Handling & Storage

Use/Stability	As indicated on product label or CoA when stored as recommended.
Short Term Storage	Ambient
Long Term Storage	Ambient
Shipping	Ambient Temperature

Regulatory Status

RUO - Research Use Only

Product Details

Alternative Name	BAY2353, 5-chloro-N-(2-chloro-4-nitrophenyl)-2-hydroxybenzamide
Appearance	Yellow solid.
CAS	50-65-7
Couple Target	STAT
Couple Type	Inhibitor
Formula	$C_{13}H_8Cl_2N_2O_4$
Identity	Determined by NMR.
MW	327.13
Purity	≥98% (TLC)
Solubility	Soluble in DMSO (up to 3 mg/mL), or in ethanol (up to 6 mg/mL).

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